



EBERLINE

SERVICES

0060824

July 8, 2003

Mr. Steve Trent
Fluor Hanford, Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: P.O. #630
Eberline Services R3-05-162-7526, SDG H2230

Dear Mr. Trent:

Enclosed is the data report for two water samples designated under SAF No. F03-007 received at Eberline Services on May 23, 2003. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package

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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2230 consisted of two water samples designated under SAF No. F03-007 with a Project Designation of: 200-PW-2/200-PW-4 OU- QC Sampling.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The LCS and method blank were not scaled to the nominal aliquot of 0.01 L. No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

The LCS and method blank were not scaled to the nominal aliquot of 0.03 L. No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the reanalyses.

2.6 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.8 Neptunium-237 Analyses


The LCS percent recovery (84%) was below the 3σ limits (89 to 111%), but was within the laboratory protocol limits (80 to 120%). No other problems were encountered during the course of the analyses.

2.9 Total Uranium Analyses

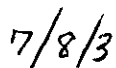
No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."



Melissa C. Mannion
Program Manager



Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2230

S U M M A R Y D A T A S E C T I O N

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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 07/08/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2230

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

LAB SAMPLE SUMMARY

SDG 7526
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2230

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R305162-01	B171B3	200-PW-2	WATER		F03-007	F03-007-12	05/21/03 11:00
R305162-02	B171B4	200-PW-2	WATER		F03-007	F03-007-12	05/21/03 09:30
R305162-03	Lab Control Sample		WATER		F03-007		
R305162-04	Method Blank		WATER		F03-007		
R305162-05	Duplicate (R305162-02)	200-PW-2	WATER		F03-007		05/21/03 09:30
R305162-06	Spike (R305162-02)	200-PW-2	WATER		F03-007		05/21/03 09:30

LAB SUMMARY

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EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2230

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7526	F03-007-12	B171B3	WATER		10.25 L		05/23/03	2	R305162-01	7526-001
		B171B4	WATER		10.25 L		05/23/03	2	R305162-02	7526-002
		Method Blank	WATER						R305162-04	7526-004
		Lab Control Sample	WATER						R305162-03	7526-003
		Duplicate (R305162-02)	WATER		10.25 L		05/23/03	2	R305162-05	7526-005
		Spike (R305162-02)	WATER		10.25 L		05/23/03	2	R305162-06	7526-006

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2230

TEST	MATRIX	METHOD	PREPARATION	ERROR	PLANCHETS ANALYZED				QUALI-			
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS	DUP/ORIG	MS/ORIG
Alpha Spectroscopy												
NP	WATER	Neptunium in Water	7071-029	5.0	2			1	1	1/1		
TH	WATER	Thorium, Isotopic in Water	7071-029	5.0	2			1	1	1/1		
Beta Counting												
SR	WATER	Total Strontium in Water	7071-029	10.0	2			1	1	1/1		
TC	WATER	Technetium 99 in Water	7071-029	10.0	2			1	1	1/1		
Gamma Spectroscopy												
I	WATER	Iodine 129 in Water	7071-029	5.0	2			1	1	1/1		
Kinetic Phosphorimetry (KPA)												
U_T	WATER	Uranium, Total in Water	7071-029	9.0	2			1	1	1/1		
Liquid Scintillation Counting												
C	WATER	Carbon 14 in Water	7071-029	10.0	2			1	1	1/1	1/1	X
H	WATER	Tritium in Water	7071-029	10.0	2			1	1	1/1	1/1	X
NI_L	WATER	Nickel-63 in Liquid	7071-029	10.0	2			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2230

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
R305162-01	B171B3			7526-001	C		06/25/03	07/08/03	MCM	Carbon 14 in Water
05/21/03	200-PW-2		WATER	7526-001	H		06/28/03	07/08/03	MCM	Tritium in Water
05/23/03	F03-007-12	F03-007		7526-001	I		06/26/03	07/08/03	MCM	Iodine 129 in Water
				7526-001	NI_L		06/19/03	07/08/03	MCM	Nickel-63 in Liquid
				7526-001	NP		06/24/03	07/08/03	MCM	Neptunium in Water
				7526-001	SR		06/24/03	07/08/03	MCM	Total Strontium in Water
				7526-001	TC		07/05/03	07/08/03	MCM	Technetium 99 in Water
				7526-001	TH		06/25/03	07/08/03	MCM	Thorium, Isotopic in Water
				7526-001	U_T		06/18/03	07/08/03	MCM	Uranium, Total in Water
R305162-02	B171B4			7526-002	C		06/25/03	07/08/03	MCM	Carbon 14 in Water
05/21/03	200-PW-2		WATER	7526-002	H		06/28/03	07/08/03	MCM	Tritium in Water
05/23/03	F03-007-12	F03-007		7526-002	I		06/27/03	07/08/03	MCM	Iodine 129 in Water
				7526-002	NI_L		06/19/03	07/08/03	MCM	Nickel-63 in Liquid
				7526-002	NP		06/24/03	07/08/03	MCM	Neptunium in Water
				7526-002	SR		06/24/03	07/08/03	MCM	Total Strontium in Water
				7526-002	TC		07/05/03	07/08/03	MCM	Technetium 99 in Water
				7526-002	TH		06/25/03	07/08/03	MCM	Thorium, Isotopic in Water
				7526-002	U_T		06/18/03	07/08/03	MCM	Uranium, Total in Water
R305162-03	Lab Control Sample			7526-003	C		06/25/03	07/08/03	MCM	Carbon 14 in Water
			WATER	7526-003	H		06/28/03	07/08/03	MCM	Tritium in Water
		F03-007		7526-003	I		06/30/03	07/08/03	MCM	Iodine 129 in Water
				7526-003	NI_L		06/20/03	07/08/03	MCM	Nickel-63 in Liquid
				7526-003	NP		06/24/03	07/08/03	MCM	Neptunium in Water
				7526-003	SR		06/24/03	07/08/03	MCM	Total Strontium in Water
				7526-003	TC		07/04/03	07/08/03	MCM	Technetium 99 in Water
				7526-003	TH		06/25/03	07/08/03	MCM	Thorium, Isotopic in Water
				7526-003	U_T		06/18/03	07/08/03	MCM	Uranium, Total in Water
R305162-04	Method Blank			7526-004	C		06/25/03	07/08/03	MCM	Carbon 14 in Water
			WATER	7526-004	H		06/28/03	07/08/03	MCM	Tritium in Water
		F03-007		7526-004	I		06/27/03	07/08/03	MCM	Iodine 129 in Water
				7526-004	NI_L		06/20/03	07/08/03	MCM	Nickel-63 in Liquid
				7526-004	NP		06/24/03	07/08/03	MCM	Neptunium in Water
				7526-004	SR		06/24/03	07/08/03	MCM	Total Strontium in Water
				7526-004	TC		07/04/03	07/08/03	MCM	Technetium 99 in Water
				7526-004	TH		06/25/03	07/08/03	MCM	Thorium, Isotopic in Water
				7526-004	U_T		06/18/03	07/08/03	MCM	Uranium, Total in Water

WORK SUMMARY

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EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2230

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
R305162-05	Duplicate (R305162-02)			7526-005	C		06/25/03	07/08/03	MCM	Carbon 14 in Water
05/21/03	200-PW-2		WATER	7526-005	H		06/29/03	07/08/03	MCM	Tritium in Water
05/23/03		F03-007		7526-005	I		06/27/03	07/08/03	MCM	Iodine 129 in Water
				7526-005	NI_L		06/20/03	07/08/03	MCM	Nickel-63 in Liquid
				7526-005	NP		06/24/03	07/08/03	MCM	Neptunium in Water
				7526-005	SR		06/24/03	07/08/03	MCM	Total Strontium in Water
				7526-005	TC		07/04/03	07/08/03	MCM	Technetium 99 in Water
				7526-005	TH		06/30/03	07/08/03	MCM	Thorium, Isotopic in Water
				7526-005	U_T		06/18/03	07/08/03	MCM	Uranium, Total in Water
R305162-06	Spike (R305162-02)			7526-006	C		06/25/03	07/08/03	MCM	Carbon 14 in Water
05/21/03	200-PW-2		WATER	7526-006	H		06/29/03	07/08/03	MCM	Tritium in Water
05/23/03		F03-007								

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
C	F03-007	Carbon 14 in Water	C14_CHEM_LSC	2			1	1	1	1	6
H	F03-007	Tritium in Water	906.0_H3_LSC	2			1	1	1	1	6
I	F03-007	Iodine 129 in Water	I129_SEP_LEPS_GS	2			1	1	1		5
NI_L	F03-007	Nickel-63 in Liquid	NI63_LSC	2			1	1	1		5
NP	F03-007	Neptunium in Water	NP237_LLE_PLATE_AEA	2			1	1	1		5
SR	F03-007	Total Strontium in Water	SRTOT_SEP_PRECIP_GPC	2			1	1	1		5
TC	F03-007	Technetium 99 in Water	TC99_TR_SEP_LSC	2			1	1	1		5
TH	F03-007	Thorium, Isotopic in Water	THISO_IE_PLATE_AEA	2			1	1	1		5
U_T	F03-007	Uranium, Total in Water	UTOT_KPA	2			1	1	1		5
TOTALS				18			9	9	9	2	47

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2230

7526-004

Method Blank

METHOD BLANK

SDG <u>7526</u>	Client/Case no <u>Hanford</u>	SDG <u>H2230</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R305162-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7526-004</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>F03-007</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Tritium	10028-17-8	1.11	11	19	400	U	H
Carbon 14	14762-75-5	-0.145	0.74	1.2	200	U	C
Nickel 63	13981-37-8	-0.830	1.4	2.5	15	U	NI_L
Total Strontium	SR-RAD	0.062	0.34	0.69	2.0	U	SR
Technetium 99	14133-76-7	0.575	1.6	4.5	15	U	TC
Thorium 228	14274-82-9	0.025	0.051	0.19		U	TH
Thorium 230	14269-63-7	0.025	0.10	0.19	1.0	U	TH
Thorium 232	TH-232	0.025	0.051	0.19	1.0	U	TH
Total Uranium (ug/L)	7440-61-1	0	0.008	0.018	0.10	U	U_T
Neptunium 237	13994-20-2	0.010	0.039	0.074	1.0	U	NP
Iodine 129	15046-84-1	-0.473	1.4	3.2	5.0	U	I

200-PW-2/200-PW-4 OU - QC Sampling

QC-BLANK #44880

METHOD BLANKS

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

7526-003

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7526</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R305162-03</u> Dept sample id <u>7526-003</u>	Client/Case no <u>Hanford</u> SDG <u>H2230</u> Contract <u>No. 630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>WATER</u> SAF No <u>F03-007</u>
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ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	262	18	19	400		H	276	11	95	82-118	80-120
Carbon 14	252	2.8	1.3	200		C	255	10	99	84-116	80-120
Nickel 63	317	5.5	2.3	15		NI_L	342	14	93	85-115	80-120
Total Strontium	43.6	2.0	0.70	2.0		SR	44.0	1.8	99	83-117	80-120
Technetium 99	1240	30	5.9	15		TC	1200	48	103	83-117	80-120
Thorium 230	26.4	2.7	0.18	1.0		TH	28.0	1.1	94	83-117	80-120
Total Uranium (ug/L)	93.5	11	<u>0.18</u>	0.10		U_T	90.5	3.6	103	76-124	80-120
Neptunium 237	45.9	2.2	0.074	1.0		NP	54.5	2.2	<u>84</u>	89-111	80-120
Iodine 129	544	4.8	<u>6.0</u>	5.0		I	508	20	107	90-110	80-120

200-PW-2/200-PW-4 OU - QC Sampling

QC-LCS #44879

LAB CONTROL SAMPLES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

7526-005

B171B4

DUPLICATE

SDG <u>7526</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R305162-05</u> Dept sample id <u>7526-005</u>	ORIGINAL Lab sample id <u>R305162-02</u> Dept sample id <u>7526-002</u> Received <u>05/23/03</u>	Client/Case no <u>Hanford</u> SDG <u>H2230</u> Contract No. <u>630</u> Client sample id <u>B171B4</u> Location/Matrix <u>200-PW-2</u> <u>WATER</u> Collected/Volume <u>05/21/03 09:30</u> <u>10.25 L</u> Custody/SAF No <u>F03-007-12</u> <u>F03-007</u>
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ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	149	120	190	400	U	H	92.5	120	190	U	-	
Carbon 14	-8.90	26	44	200	U	C	3.84	24	41	U	-	
Nickel 63	-1.28	1.4	2.4	15	U	NI_L	-0.771	1.4	2.4	U	-	
Total Strontium	-0.120	0.32	0.70	2.0	U	SR	-0.266	0.31	0.72	U	-	
Technetium 99	2.38	2.3	4.9	15	U	TC	2.63	2.3	4.1	U	-	
Thorium 228	0.069	0.083	0.13		U	TH	0	0.046	0.18	U	-	
Thorium 230	0.220	0.11	0.13	1.0		TH	0.023	0.092	0.18	U	162	178
Thorium 232	0.014	0.055	0.13	1.0	U	TH	0	0.046	0.18	U	-	
Total Uranium (ug/L)	-0.006	0.008	0.018	0.10	U	U_T	-0.002	0.008	0.018	U	-	
Neptunium 237	0.052	0.042	0.031	1.0		NP	0	0.028	0.11	U	200	292
Iodine 129	-0.448	2.7	<u>6.1</u>	5.0	U	I	0.174	1.4	3.2	U	-	

200-PW-2/200-PW-4 OU - QC Sampling

QC-DUP#2 44881

DUPLICATES

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EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2230

7526-006

B171B4

MATRIX SPIKE

SDG <u>7526</u> Contact <u>Melissa C. Mannion</u> MATRIX SPIKE Lab sample id <u>R305162-06</u> Dept sample id <u>7526-006</u>	ORIGINAL Lab sample id <u>R305162-02</u> Dept sample id <u>7526-002</u> Received <u>05/23/03</u>	Client/Case no <u>Hanford</u> <u>SDG H2230</u> Contract <u>No. 630</u> Client sample id <u>B171B4</u> Location/Matrix <u>200-PW-2</u> <u>WATER</u> Collected/Volume <u>05/21/03 09:30</u> <u>10.25 L</u> Custody/SAF No <u>F03-007-12</u> <u>F03-007</u>
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ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUAL1- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC 3σ % (TOTAL)	LMTS LIMITS	PROTOCOL
Tritium	23900	440	200	400	X H	24800	990	92.5	120	96	84-116	60-140
Carbon 14	54900	550	130	200	X C	63800	2600	3.84	24	86	86-114	60-140

200-PW-2/200-PW-4 OU - QC Sampling

QC-MS#2 44882

MATRIX SPIKES

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-MS</u>
Version <u>3.06</u>
Report date <u>07/08/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2230

7526-001

B171B3

D A T A S H E E T

SDG <u>7526</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> Contract <u>No. 630</u>	SDG <u>H2230</u>
Lab sample id <u>R305162-01</u> Dept sample id <u>7526-001</u> Received <u>05/23/03</u>	Client sample id <u>B171B3</u> Location/Matrix <u>200-PW-2</u> <u>WATER</u> Collected/Volume <u>05/21/03 11:00</u> <u>10.25 L</u> Custody/SAF No <u>F03-007-12</u> <u>F03-007</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Tritium	10028-17-8	77.2	120	190	400	U	H
Carbon 14	14762-75-5	-8.01	24	41	200	U	C
Nickel 63	13981-37-8	-0.523	1.1	2.0	15	U	NI_L
Total Strontium	SR-RAD	-0.044	0.33	0.69	2.0	U	SR
Technetium 99	14133-76-7	2.52	1.4	3.6	15	U	TC
Thorium 228	14274-82-9	0	0.039	0.15		U	TH
Thorium 230	14269-63-7	0.115	0.12	0.15	1.0	U	TH
Thorium 232	TH-232	0.019	0.038	0.15	1.0	U	TH
Total Uranium (ug/L)	7440-61-1	-0.004	0.008	0.018	0.10	U	U_T
Neptunium 237	13994-20-2	0.025	0.050	0.095	1.0	U	NP
Iodine 129	15046-84-1	1.56	2.5	<u>5.7</u>	5.0	U	I

200-PW-2/200-PW-4 OU - QC Sampling

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/08/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2230

7526-002

B171B4

DATA SHEET

SDG <u>7526</u>	Client/Case no <u>Hanford</u>	SDG <u>H2230</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R305162-02</u>	Client sample id <u>B171B4</u>	
Dept sample id <u>7526-002</u>	Location/Matrix <u>200-PW-2</u>	<u>WATER</u>
Received <u>05/23/03</u>	Collected/Volume <u>05/21/03 09:30</u>	<u>10.25 L</u>
	Custody/SAF No <u>F03-007-12</u>	<u>F03-007</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Tritium	10028-17-8	92.5	120	190	400	U	H
Carbon 14	14762-75-5	3.84	24	41	200	U	C
Nickel 63	13981-37-8	-0.771	1.4	2.4	15	U	NI_L
Total Strontium	SR-RAD	-0.266	0.31	0.72	2.0	U	SR
Technetium 99	14133-76-7	2.63	2.3	4.1	15	U	TC
Thorium 228	14274-82-9	0	0.046	0.18		U	TH
Thorium 230	14269-63-7	0.023	0.092	0.18	1.0	U	TH
Thorium 232	TH-232	0	0.046	0.18	1.0	U	TH
Total Uranium (ug/L)	7440-61-1	-0.002	0.008	0.018	0.10	U	U_T
Neptunium 237	13994-20-2	0	0.028	0.11	1.0	U	NP
Iodine 129	15046-84-1	0.174	1.4	3.2	5.0	U	I

200-PW-2/200-PW-4 OU - QC Sampling

DATA SHEETS

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Lab id <u>EBRLNE</u>
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Report date <u>07/08/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

Test NP Matrix WATER
SDG 7526
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NEPTUNIUM IN WATER
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2230

RESULTS

LAB	RAW	SUF-	Neptunium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID

Preparation batch 7071-029

R305162-01	7526-001	B171B3	U
R305162-02	7526-002	B171B4	U
R305162-03	7526-003	LCS (QC ID=44879)	<u>LOW</u>
R305162-04	7526-004	BLK (QC ID=44880)	U
R305162-05	7526-005	Duplicate (R305162-02)	ok

Nominal values and limits from method RDLs (pCi/L) 1.0
200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 7071-029 2σ prep error 5.0 % Reference Lab Notebook 7071 pg. 029

R305162-01	B171B3	0.095	0.200	48	1079	34	06/24/03	06/24	SS-056
R305162-02	B171B4	0.11	0.200	47	1079	34	06/24/03	06/24	SS-057
R305162-03	LCS (QC ID=44879)	0.074	0.200	65	1080		06/24/03	06/24	SS-058
R305162-04	BLK (QC ID=44880)	0.074	0.200	64	1080		06/24/03	06/24	SS-059
R305162-05	Duplicate (R305162-02)	0.031	0.200	55	1080	34	06/24/03	06/24	SS-060
	(QC ID=44881)								

Nominal values and limits from method 1.0 0.200 20-105 100 180

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
CP-040	Environmental Water Dissolution, rev 5	
CP-930	Neptunium from Solids and Water by Extraction Chromatography, rev 0	
CP-008	Heavy Element Electroplating, rev 7	

AVERAGES ± 2 SD	MDA	0.077 ± 0.060
FOR 5 SAMPLES	YIELD	56 ± 17

METHOD SUMMARIES

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Lab id	EBRLNE
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Report date	07/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN WATER
ALPHA SPECTROSCOPY

Client Hanford

Contract No. 630

Contract SDG H2230

Test TH Matrix WATER

SDG 7526

Contact Melissa C. Mannion

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Thorium 230

Preparation batch 7071-029

R305162-01	7526-001	B171B3	U
R305162-02	7526-002	B171B4	U
R305162-03	7526-003	LCS (QC ID=44879)	ok
R305162-04	7526-004	BLK (QC ID=44880)	U
R305162-05	7526-005	Duplicate (R305162-02)	ok

Nominal values and limits from method RDLs (pCi/L) 1.0
200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR

Preparation batch 7071-029 2σ prep error 5.0 % Reference Lab Notebook 7071 pg. 029

R305162-01	B171B3	0.15	0.500	72	179	35	06/24/03	06/25	SS-052
R305162-02	B171B4	0.18	0.400	78	180	35	06/24/03	06/25	SS-055
R305162-03	LCS (QC ID=44879)	0.18	0.400	75	180		06/24/03	06/25	SS-056
R305162-04	BLK (QC ID=44880)	0.19	0.400	76	180		06/24/03	06/25	SS-057
R305162-05	Duplicate (R305162-02) (QC ID=44881)	0.13	0.400	23	1028	40	06/24/03	06/30	SS-056

Nominal values and limits from method 1.0 0.400 20-110 150 100 180

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
CP-040	Environmental Water Dissolution, rev 5	
CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1	
CP-008	Heavy Element Electroplating, rev 7	

AVERAGES ± 2 SD	MDA <u>0.17</u> ± <u>0.050</u>
FOR 5 SAMPLES	YIELD <u>65</u> ± <u>47</u>

METHOD SUMMARIES

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Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LMS

Version 3.06

Report date 07/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

Test SR Matrix WATER
SDG 7526
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN WATER
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2230

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium
Preparation batch 7071-029				
R305162-01		7526-001	B171B3	U
R305162-02		7526-002	B171B4	U
R305162-03		7526-003	LCS (QC ID=44879)	ok
R305162-04		7526-004	BLK (QC ID=44880)	U
R305162-05		7526-005	Duplicate (R305162-02)	- U
Nominal values and limits from method				
			RDLs (pCi/L)	2.0
200-PW-2/200-PW-4 OU - QC Sampling				

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 7071-029 2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 029													
R305162-01		B171B3	0.69	0.500			81		100			34 06/24/03 06/24	GRB-217
R305162-02		B171B4	0.72	0.500			76		100			34 06/24/03 06/24	GRB-218
R305162-03		LCS (QC ID=44879)	0.70	0.500			79		100			06/24/03 06/24	GRB-219
R305162-04		BLK (QC ID=44880)	0.69	0.500			77		100			06/24/03 06/24	GRB-220
R305162-05		Duplicate (R305162-02) (QC ID=44881)	0.70	0.500			79		100			34 06/24/03 06/24	GRB-230
Nominal values and limits from method													
			2.0	0.500			35-105		100			180	

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
CP-380 Strontium in Water Samples, rev 0

AVERAGES ± 2 SD MDA 0.70 ± 0.024
FOR 5 SAMPLES YIELD 78 ± 4

METHOD SUMMARIES

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 07/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

Test TC Matrix WATER
SDG 7526
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN WATER

BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2230

RESULTS

LAB RAW SUF- Technetium
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 99

Preparation batch 7071-029

R305162-01	7526-001	B171B3	U
R305162-02	7526-002	B171B4	U
R305162-03	7526-003	LCS (QC ID=44879)	ok
R305162-04	7526-004	BLK (QC ID=44880)	U
R305162-05	7526-005	Duplicate (R305162-02)	- U

Nominal values and limits from method RDLs (pCi/L) 15
200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST	FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED YZED DETECTOR

Preparation batch 7071-029 2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 029

R305162-01	B171B3	3.6	0.100	95	100	45	07/01/03	07/05	GRB-203
R305162-02	B171B4	4.1	0.100	87	100	45	07/01/03	07/05	GRB-204
R305162-03	LCS (QC ID=44879)	5.9	0.100	90	50		07/01/03	07/04	GRB-204
R305162-04	BLK (QC ID=44880)	4.5	0.100	98	65		07/01/03	07/04	GRB-203
R305162-05	Duplicate (R305162-02) (QC ID=44881)	4.9	0.100	93	65	44	07/01/03	07/04	GRB-204

Nominal values and limits from method 15 0.100 20-105 50 180

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
CP-021	Preparation of Tc-99m Tracer, rev 2	
CP-002	Q.C. Preparation, rev 4	
CP-003	Addition of Carriers and Tracers, rev 5	
CP-430	Technetium-99 Purification (Water) by Extraction Chromatography, rev 0	
CP-008	Heavy Element Electroplating, rev 7	

AVERAGES ± 2 SD	MDA	4.6	±	1.7
FOR 5 SAMPLES	YIELD	93	±	9

METHOD SUMMARIES

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
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Version 3.06
Report date 07/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

Test I Matrix WATER
SDG 7526
Contact Melissa C. Mannion

LAB METHOD SUMMARY

IODINE 129 IN WATER
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2230

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Iodine 129

Preparation batch 7071-029

R305162-01	7526-001	B171B3	U
R305162-02	7526-002	B171B4	U
R305162-03	7526-003	LCS (QC ID=44879)	ok
R305162-04	7526-004	BLK (QC ID=44880)	U
R305162-05	7526-005	Duplicate (R305162-02)	- U

Nominal values and limits from method RDLs (pCi/L) 5.0
200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/L L FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7071-029 2σ prep error 5.0 % Reference Lab Notebook 7071 pg. 029

R305162-01	B171B3	<u>5.7</u>	0.250	89	934	36	06/24/03	06/26	XSPEC-016
R305162-02	B171B4	<u>3.2</u>	0.250	89	607	37	06/24/03	06/27	XSPEC-004
R305162-03	LCS (QC ID=44879)	<u>6.0</u>	0.250	92	1066		06/24/03	06/30	XSPEC-004
R305162-04	BLK (QC ID=44880)	<u>3.2</u>	0.250	89	837		06/24/03	06/27	XSPEC-004
R305162-05	Duplicate (R305162-02) (QC ID=44881)	<u>6.1</u>	0.250	91	837	37	06/24/03	06/27	XSPEC-016

Nominal values and limits from method 5.0 0.250 20-105 300 100 180

PROCEDURES REFERENCE I129_SEP_LEPS_GS
CP-530 Iodine-129 Purification, rev 0

AVERAGES ± 2 SD MDA 4.8 ± 3.0
FOR 5 SAMPLES YIELD 90 ± 3

METHOD SUMMARIES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

LAB METHOD SUMMARY

URANIUM, TOTAL IN WATER
KINETIC PHOSPHORIMETRY (KPA)

Test U I Matrix WATER
SDG 7526
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2230

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Uranium
Preparation batch 7071-029				
R305162-01		7526-001	B171B3	U
R305162-02		7526-002	B171B4	U
R305162-03		7526-003	LCS (QC ID=44879)	ok
R305162-04		7526-004	BLK (QC ID=44880)	U
R305162-05		7526-005	Duplicate (R305162-02)	- U

Nominal values and limits from method RDLs (ug/L) 0.10
200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWMH	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	ug/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 7071-029					2σ prep error 9.0 %					Reference Lab Notebook 7071 pg. 029			
R305162-01		B171B3	0.018	0.0200								28 06/18/03 06/18	KPA-001
R305162-02		B171B4	0.018	0.0200								28 06/18/03 06/18	KPA-001
R305162-03		LCS (QC ID=44879)	0.18	0.0200								06/18/03 06/18	KPA-001
R305162-04		BLK (QC ID=44880)	0.018	0.0200								06/18/03 06/18	KPA-001
R305162-05		Duplicate (R305162-02)	0.018	0.0200								28 06/18/03 06/18	KPA-001
		(QC ID=44881)											

Nominal values and limits from method 0.10 0.0200 180

PROCEDURES REFERENCE UTOT_KPA
CP-044 Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
CP-928 Total Uranium by Kinetic Phosphorimetry, rev 5

AVERAGES ± 2 SD MDA 0.050 ± 0.14
FOR 5 SAMPLES YIELD ±

METHOD SUMMARIES

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Version 3.06
Report date 07/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

Test C Matrix WATER
SDG 7526
Contact Melissa C. Mannion

LAB METHOD SUMMARY

CARBON 14 IN WATER
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2230

RESULTS

LAB	RAW	SUF-		
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14
Preparation batch 7071-029				
R305162-01		7526-001	B171B3	U
R305162-02		7526-002	B171B4	U
R305162-03		7526-003	LCS (QC ID=44879)	ok
R305162-04		7526-004	BLK (QC ID=44880)	U
R305162-05		7526-005	Duplicate (R305162-02)	- U
R305162-06		7526-006	Spike (R305162-02)	ok X

Nominal values and limits from method RDLs (pCi/L) 200
200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7071-029 2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 029															
R305162-01		B171B3	41	0.0300			100		100			35	06/25/03	06/25	LSC-004
R305162-02		B171B4	41	0.0300			100		100			35	06/25/03	06/25	LSC-004
R305162-03		LCS (QC ID=44879)	1.3	1.00			100		100				06/25/03	06/25	LSC-004
R305162-04		BLK (QC ID=44880)	1.2	1.00			100		100				06/25/03	06/25	LSC-004
R305162-05		Duplicate (R305162-02)	44	0.0300			100		100			35	06/25/03	06/25	LSC-004
		(QC ID=44881)													
R305162-06		Spike (R305162-02)	130	0.0200			100		25			35	06/25/03	06/25	LSC-004
		(QC ID=44882)													

Nominal values and limits from method 200 0.0300 50 180

PROCEDURES REFERENCE C14_CHEM_LSC
CP-241 Carbon-14 in Aqueous Samples, rev 4

AVERAGES ± 2 SD MDA 43 ± 94
FOR 6 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

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Lab id EBRLE
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Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 07/08/03

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2230

Test H Matrix WATER
SDG 7526
Contact Melissa C. Mannion

LAB METHOD SUMMARY
TRITIUM IN WATER
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2230

RESULTS

LAB	RAW	SUF-		
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Tritium
Preparation batch 7071-029				
R305162-01		7526-001	B17183	U
R305162-02		7526-002	B17184	U
R305162-03		7526-003	LCS (QC ID=44879)	ok
R305162-04		7526-004	BLK (QC ID=44880)	U
R305162-05		7526-005	Duplicate (R305162-02)	- U
R305162-06		7526-006	Spike (R305162-02)	ok X

Nominal values and limits from method RDLs (pCi/L) 400
200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-		MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
SAMPLE ID	TEST	FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7071-029 2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 029																
R305162-01			B17183	190	0.0100			100		120			38	06/27/03	06/28	LSC-004
R305162-02			B17184	190	0.0100			100		120			38	06/27/03	06/28	LSC-004
R305162-03			LCS (QC ID=44879)	19	1.00			10		120				06/27/03	06/28	LSC-004
R305162-04			BLK (QC ID=44880)	19	1.00			10		120				06/27/03	06/28	LSC-004
R305162-05			Duplicate (R305162-02)	190	0.0100			100		120			39	06/27/03	06/29	LSC-004
			(QC ID=44881)													
R305162-06			Spike (R305162-02)	200	0.0350			28		120			39	06/27/03	06/29	LSC-004
			(QC ID=44882)													

Nominal values and limits from method 400 0.0100 25 180

PROCEDURES REFERENCE 906.0_H3_LSC
CP-210 Tritium in Water Samples by Distillation, rev 6

AVERAGES ± 2 SD MDA 130 ± 180
FOR 6 SAMPLES YIELD 58 ± 93

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 07/08/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2230

Test NI L Matrix WATER

SDG 7526

Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL-63 IN LIQUID

LIQUID SCINTILLATION COUNTING

Client Hanford

Contract No. 630

Contract SDG H2230

RESULTS

LAB RAW SUF-

SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 7071-029

R305162-01	7526-001	B171B3	U
R305162-02	7526-002	B171B4	U
R305162-03	7526-003	LCS (QC ID=44879)	ok
R305162-04	7526-004	BLK (QC ID=44880)	U
R305162-05	7526-005	Duplicate (R305162-02)	- U

Nominal values and limits from method RDLs (pCi/L) 15

200-PW-2/200-PW-4 OU - QC Sampling

METHOD PERFORMANCE

LAB RAW SUF-

SAMPLE ID TEST FIX CLIENT SAMPLE ID MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
pCi/L L FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7071-029 2σ prep error 10.0 % Reference Lab Notebook 7071 pg. 029

R305162-01	B171B3	2.0	0.500	95	100	29	06/19/03	06/19	LSC-007
R305162-02	B171B4	2.4	0.400	96	100	29	06/19/03	06/19	LSC-007
R305162-03	LCS (QC ID=44879)	2.3	0.400	95	100		06/19/03	06/20	LSC-007
R305162-04	BLK (QC ID=44880)	2.5	0.400	91	100		06/19/03	06/20	LSC-007
R305162-05	Duplicate (R305162-02) (QC ID=44881)	2.4	0.400	95	100	30	06/19/03	06/20	LSC-007

Nominal values and limits from method 15 0.400 50 180

PROCEDURES	REFERENCE	NI63_LSC
	CP-040	Environmental Water Dissolution, rev 5
	CP-280	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD	MDA	2.3	±	0.38
FOR 5 SAMPLES	YIELD	94	±	4

METHOD SUMMARIES

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Protocol Hanford

Version Ver 1.0

Form DVD-LMS

Version 3.06

Report date 07/08/03

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2230

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/08/03

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2230

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified.
Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

REPORT GUIDES

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SUMMARY DATA SECTION

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SDG 7526
Contact Melissa C. Mannion

REPORT GUIDE

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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Case no SDG H2230

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/08/03

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/08/03

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REPORT GUIDE

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

REPORT GUIDES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H2230

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Contact Melissa C. Mannion

GUIDE, cont.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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SUMMARY DATA SECTION

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Version Ver 1.0
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Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

REPORT GUIDE

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Contract No. 630
Case no SDG H2230

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

GUIDE, cont.

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Case no SDG H2230

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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SUMMARY DATA SECTION

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SDG 7526
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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Case no SDG H2230

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H2230

SDG 7526
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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Case no SDG H2230

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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SUMMARY DATA SECTION

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Form DVD-RG
Version 3.06
Report date 07/08/03

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F03-007-12		Page 1 of 1				
Collector Johansen/Pfister/Pope		Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ		Price Code 7N		Data Turnaround 45 Days				
Project Designation 200-PW-2/200-PW-4 OU - QC Sampling		Sampling Location 200-PW-2		H2230 (7526)		SAF No. F03-007		Air Quality <input type="checkbox"/>						
Ice Chest No. <u>ERC 01040</u>		Field Logbook No. HNF-N-3361		COA 117504ES10		Method of Shipment Federal Express								
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. <u>A030766</u>				Bill of Lading/Air Bill No. <u>688 25PC</u>								
POSSIBLE SAMPLE HAZARDS/REMARKS N/A Special Handling and/or Storage N/A				Preservation	Cool 4C	H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HCl to pH <2	None	None
				Type of Container	P	P	P	P	P	P	P	P	P	P
				No. of Container(s)	1	1	1	1	2	1	1	1	1	4
				Volume	500mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL	500mL	250mL	1000mL
SAMPLE ANALYSIS				See item (1) in Special Instructions	NO2/NO3 - 353.2; Ammonia - 350.3	Isotopic Thorium (Thorium-232)	Total Uranium	Strontium-89,90 - Total Sr	Neptunium-237	Nickel-63	Technetium-99	Tritium - H3; Carbon-14	Iodine-129	
Sample No.	Matrix *	Sample Date	Sample Time											
B171B3	WATER	5-21-03	1100	X	X	X	X	X	X	X	X	X	X	
B171B4	WATER	5-21-03	0930	X	X	X	X	X	X	X	X	X	X	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		954 5/21/03 (*) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) Personnel not available to relinquish samples from the 3728 Ref # <u>38</u> on <u>5/22/03</u>				S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dry Solids DL=Dry Liquids T=Time WI=Wipe L=Liquid V=Vegetation X=Other		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By		Title				Date/Time						
FINAL SAMPLE DEPOSITION		Disposal Method		Disposed By				Date/Time						

**ANALYTICAL SERVICES GROUP**

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

Client: FLR Date/Time received 1000 5-23-08

CoC No. EC-007-12

Container I.D. No. EC-01-037 Requested TAT (Days) 45 P.O. Received Yes ☐ No ☐

INSPECTION

1. Custody seals on shipping container intact? Yes ☒ No ☐ N/A ☐

2. Custody seals on shipping container dated & signed? Yes ☒ No ☐ N/A ☐

3. Custody seals on sample containers intact? Yes ☒ No ☐ N/A ☐

4. Custody seals on sample containers dated & signed? Yes ☒ No ☐ N/A ☐

5. Packing material is: Wet ☐ Dry ☒

6. Number of samples in shipping container: 2

7. Number of containers per sample: 2 (Or see CoC _____)

8. Paperwork agrees with samples? Yes ☒ No ☐

9. Samples have: Tape ☐ Hazard labels ☐ Rad labels ☐ Appropriate sample labels ☒

10. Samples are: In good condition ☒ Leaking ☐ Broken Container ☐ Missing ☐

11. Samples are: Preserved ☒ Not preserved ☐ Preservative HNO3/HCL

12. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes ☐ No ☐ Date _____

14. Received by [Signature] Date: 5-23-08 Time: 1000

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

Ion Chamber Ser. No. _____

Calibration date _____

Alpha Meter Ser. No. _____

Calibration date _____

Beta/Gamma Meter Ser. No. _____

Calibration date _____



11

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352



Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0305L488
SDG #	H2230
SAF #	F03-007
Date Received	5-23-03
# Samples	2
Matrix	Soil
Volatiles	
Semivolatiles	
Pest/PCB	
DRO/GRO/KRO	
Herbicides	
GC Alcohol	
Metals	
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

c:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-007 H2230



DATE RECEIVED: 05/23/03

LVL LOT # :0305L488

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
---------------------	-------	-----	--------	------------	-----------	----------

B171B3

NITRATE NITRITE	001	W	03LN3A28	05/21/03	05/29/03	05/29/03
NITRATE NITRITE	001 REP	W	03LN3A28	05/21/03	05/29/03	05/29/03
NITRATE NITRITE	001 MS	W	03LN3A28	05/21/03	05/29/03	05/29/03
AMMONIA	001	W	03LAM014	05/21/03	05/24/03	05/26/03
AMMONIA	001 REP	W	03LAM014	05/21/03	05/24/03	05/26/03
AMMONIA	001 MS	W	03LAM014	05/21/03	05/24/03	05/26/03

B171B4

NITRATE NITRITE	002	W	03LN3A28	05/21/03	05/29/03	05/29/03
AMMONIA	002	W	03LAM014	05/21/03	05/24/03	05/26/03

LAB QC:

NITRATE NITRITE	MB1	W	03LN3A28	N/A	05/29/03	05/29/03
NITRATE NITRITE	MB1 BS	W	03LN3A28	N/A	05/29/03	05/29/03
AMMONIA	MB1	W	03LAM014	N/A	05/24/03	05/26/03
AMMONIA	MB1 BS	W	03LAM014	N/A	05/24/03	05/26/03
AMMONIA	MB1 BSD	W	03LAM014	N/A	05/24/03	05/26/03



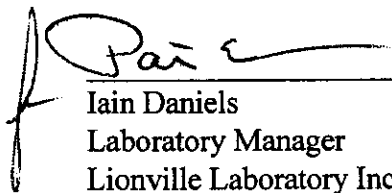
Analytical Report

Client: TNU-HANFORD F03-007 H2230
LVL#: 0305L488

W.O.#: 11343-606-001-9999-00
Date Received: 05-23-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 water samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries for Nitrate Nitrite and Ammonia were within the 75-125% control limits.
8. The replicate analyses for Nitrate Nitrite and Ammonia were within the 20% RPD control limit.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

njp05-488

06-06-03
Date

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

02
03
04

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
Acidity	305.1		
___ Alkalinity ___ Bicarbonate ___ Carbonate	310.1		
BOD	405.1		___ 5210B (b)
Ion Chromatography:			
___ Bromide ___ Chloride ___ Fluoride	300.0	___ 9056	
___ Nitrate ___ Nitrite ___ Phosphate	300.0	___ 9056	
___ Sulfate ___ Formate ___ Acetate ___ Oxalate	300.0	___ 9056	
Chloride	325.2	___ 9251	
Chlorine, Residual	330.5 (mod)		
Cyanide, Amenable to Chlorination	335.2	___ 9010B	
Cyanide, Total	335.2	___ 9010B	___ 9014 ___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable			___ 412 (a) ___ 4500CN-I (b)
COD	410.4(mod)		___ 5220C (b)
Color	110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	340.2		___ 4500-FC
Hardness, Calcium	215.2		
Hardness, Total	130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	425.1		
✓ Nitrate-Nitrite ___ Nitrate ___ Nitrite	✓ 353.2		
Ammonia	✓ 350.3		
Total ___ Kjeldahl ___ Organic Nitrogen	351.3		
Total ___ Organic ___ Inorganic Carbon	415.1	___ 9060	
Oil & Grease	413.1	___ 9070	
___ pH ___ pH; paper	150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	418.1		
Phenol	420.1	___ 420.2 ___ 9065 ___ 9066	
___ Ortho ___ Total Phosphate	365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	160.5		
Sulfide	376.1		9030B/9034 (acid soluble)
Reactive ___ Cyanide ___ Sulfide		___ Section 7.3 (___ 9014 ___ 9030B)	
Silica	370.1		
Sulfite	377.1		
Sulfate	375.4	___ 9038	
Specific Conductance	120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach		1312	
Total ___ Dissolved ___ Suspended ___ Solids	160 ___ .1 ___ .2 ___ .3		
Total Organic Halides	450.1	___ 9020B	
Turbidity	180.1		
Volatile Solids:			
___ Total ___ Dissolved ___ Suspended	160.4		
Other:		Method:	

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
 - a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
 - b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
 - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
 - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
 - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
 - f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/03/03

CLIENT: TNUHANFORD F03-007 H2230

LVL LOT #: 0305L488

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B171B3	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0
-002	B171B4	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
		Ammonia, as N	0.10 u	MG/L	0.10	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/03/03

CLIENT: TNUHANFORD F03-007 H2230
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0305L488

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK10	03LN3A28-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	03LAM014-MB1	Ammonia, as N	0.10 u	MG/L	0.10	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/03/03

CLIENT: TNUHANFORD F03-007 H2230
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0305L488

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B171B3	Nitrate Nitrite	0.50	0.02u	0.50	99.2	1.0
		Ammonia, as N	1.9	0.10u	2.0	95.0	1.0
BLANK10	03LN3A28-MB1	Nitrate Nitrite	0.52	0.02u	0.50	103.0	1.0
BLANK10	03LAM014-MB1	Ammonia, as N	2.0	0.10u	2.0	99.5	1.0
		Ammonia, as N MSD	2.0	0.10u	2.0	102.0	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 06/03/03

CLIENT: TNUHANFORD P03-007 H2230
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0305L488

SAMPLE	SITE ID	ANALYTE	SPIKE#1	SPIKE#2	%DIFF
			%RECOV	%RECOV	
BLANK10	03LAM014-MB1	Ammonia, as N	99.5	102.0	2.5

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/03/03

CLIENT: TNUHANFORD F03-007 H2230
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0305L488

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	B171B3	Nitrate Nitrite	0.02u	0.02u	NC	1.0
		Ammonia, as N	0.10u	0.10u	NC	1.0

03056488

Custody Transfer Record/Lab Work Request Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**[illegible]

Special Instructions:

SAF # F03-007

Run Matrix Qc

DATE/REVISIONS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Lionville Laboratory Use Only

Samples were:

1) Shipped or
Hand Delivered
Airbill #

2) Ambient or Chilled

3) Received in Good Condition ☒ or N

4) Samples
Property Preserved

5) Received Within Holding Times

Tamper Resistant Seal was:

1) Present on Outer
Package ☒ Y or N

2) Unbroken on Outer
Package  or N

3) Present on Sample ☒ Y or ☐ N

4) Unbroken on
Sample Y or N

COC Record Present
Upon Sample Rec'd

Cooler Temp. 3° °C

Relinquished by	Received by	Date	Time
FEDEX	CLH	5-23-03	0855

Relinquished by COMPOSITE WASTE	Received by ORIGINAL REWRITTEN	Date	Time
--	---	------	------

Discrepancies Between
Samples Labels and
COC Record? Y or N

75117 ספר חסידים

FH-Central Plateau Project		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						F03-007-12		Page 1 of 1					
Collector Johansen/Pfister/Pope		Company Contact LC Hulstrom		Telephone No. 373-3928		Project Coordinator TRENT, SJ		Price Code 7N		Data Turnaround 45 Days					
Project Designation 200-PW-2/200-PW-4 OU - QC Sampling		Sampling Location 200-PW-2		SAF No. F03-007		Air Quality <input type="checkbox"/>									
Ice Chest No. ERC 99 071		Field Logbook No. HNF-N-3361		COA 117504ES10		Method of Shipment Federal Express									
Shipped To REURH -EDERLINE SERVICES (Formerly TMA) 5/21/03		Offsite Property No. A030238				Bill of Lading/Air Bill No. SEB08P C									
POSSIBLE SAMPLE HAZARDS/REMARKS N/A Special Handling and/or Storage N/A				Preservation		Cool 4C	H2SO4 to pH <2 Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HCl to pH <2	None	None
				Type of Container		P	P	P	P	P	P	P	P	P	P
				No. of Container(s)		1	1	1	2	1	1	1	1	1	4
				Volume		500mL	1000mL	1000mL	500mL	1000mL	1000mL	1000mL	500mL	250mL	1000mL
SAMPLE ANALYSIS				See Item (1) in Special Instructions.		NO2/NO3 - 353.2; Ammonia - 350.3	Isotopic Thorium (Thorium-232)	Total Uranium	Strontium-89,90 - Total Sr	Neptunium-237	Nickel-63	Technetium-99	Tridium - ED; Carbon-14	Radon-129	
Sample No.		Matrix *		Sample Date		Sample Time									
B171B3		WATER		5-21-03		1100		X					X	X	
B171B4		Water		5-21-03		0930		X					X	X	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS							
Relinquished By/Removed From Johansen/Pfister/Pope 5/21/03				Received By/Stored In REF 3B 3728 52103 1400				(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate) Personnel not available to relinquish samples from the 3728 Ref # 3B on 5/22/03							
Relinquished By/Removed From REF 3B 3728 52203 1100				Received By/Stored In SJOALD/AL 52203 1100											
Relinquished By/Removed From SJOALD/AL 52203 1100				Received By/Stored In FED EX											
Relinquished By/Removed From FEDEX 5-23-03 0855				Received By/Stored In C. H. 5-23-03 0955											
Relinquished By/Removed From				Received By/Stored In											
Relinquished By/Removed From				Received By/Stored In											
LABORATORY SECTION		Received By		Title				Date/Time							
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time							

LIONVILLE LABORATORY INCORPORATED

SAMPLE RECEIPT CHECKLIST

Client: TNU - HANFORD

Order/Project:

DATE: 5-23-03

Form# SOW# / Release #: F03-007

Laboratory SDG #: 0305L488

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

- | | | | | |
|--|---|-----------------------------|---|--|
| 1. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 2. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 3. Airbill # recorded? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 5. Sample containers are intact? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 7. All samples on coc received? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 8. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 10. Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 11. Where applicable, bar code labels are affixed to coc? | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 12. coc signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 13. coc will be faxed or emailed to client? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment # |

Cooler # / temp (°C) and Comments:

RC 99-071 3°

Laboratory Sample Custodian:

Cal King

Laboratory Project Manager: